CLAIMS

1. A discharge rate and pressure control solenoid valve (1) which may be used in a circuit including a low pressure part and a high pressure part, controlling the discharge rate of a low pressure fluid with the aid of a sliding (18) spool in a liner (22) in which at least one fluid feeding orifice (20) and one fluid exhaust orifice (21) are provided, said spool (18) being electrically actuated by means of an electromagnet acting in an opposite direction to recoil means (26) for closing the passage between the feeding (20) and exhaust (21) orifices when an electromagnet control current is equal to zero and for gradually opening said passage according to a threshold value of the current, the pressure control being applied to the high pressure fluid, characterized in that the recoil means (26) are inserted between the spool (18) and a flap device capable of closing an inlet orifice (30) in the liner (22) of a high pressure fluid and connected to the low pressure fluid feeding orifice (20) at least at the position of the spool (18) corresponding to a control current less than said threshold value, the recoil means (26) being positioned and dimensioned so that the flap is openable when the current is equal to or near zero, in order to cause the pressure to drop in the high pressure circuit.

2. The discharge rate and pressure control solenoid valve (1) according to the preceding claim, characterized in that the mobile spool (18) is positioned and dimensioned so that the feeding (20) and exhaust (21) orifices for the low pressure fluid are not connected until the force exerted by the spool (18) via the recoil means (26) on the flap device, for closing the latter, is sufficient for providing said closure when the pressure reached in the high pressure circuit is the rated operating pressure.

3. The discharge rate and pressure control solenoid valve (1) according to any of the preceding claims, characterized in that the spool (18) is driven by a pusher (12) firmly attached to the mobile core (11) of the electromagnet, the recoil means consisting of a coil spring (26) axially positioned between the end of the spool (18) and the flap device.

4. The discharge rate and pressure control solenoid valve (1) according

to any of the preceding claims, characterized in that the flap device includes a sleeve (27) sliding in the liner (22) and actuated by the recoil means (26) having an axial arm provided with an end with a hemispherical aspect which may close the fluid inlet orifice (30), said orifice (30) opening into the volume of the liner (22), at a seat (37) against which the hemispherical end is pressed, in the event of closure of the flap.

5. The discharge rate and pressure control solenoid valve (1) according to any of claims 1 to 3, characterized in that the flap device includes a ball (28) which may close the high pressure fluid inlet orifice (30), said orifice (30) opening into the volume of the liner (22), at a seat (37) against which the ball (28) is pressed in the event of closure of the flap, by a sleeve (27) of the flap device sliding in said liner (22) and actuated by the recoil means (26).

6. The discharge rate and pressure control solenoid valve (1) according to any of claims 4 and 5, characterized in that the seat (37) consists in an axial conduit (36) opening into the liner (22) and chamfered at its link with the inlet orifice (30), said conduit (36) being flanked with clearance spaces for the fluid opening into the volume of the liner (22) and obtained by a cylindrical milling cutter stroke with a smaller thickness and an axis perpendicular to that of the conduit (36), respectively.

7. The discharge rate and pressure control solenoid valve (1) according to the preceding claim, characterized in that, when the flap device is a device with a ball (28), the sleeve (27) includes an axial central protrusion (35) provided for insertion into the conduit (36) of the seat (37) and for exerting a force on the ball (28).

8. The discharge rate and pressure control solenoid valve (1) according to claim 6, characterized in that, when the flap device is a device with an axial arm with a hemispherical end, said arm is provided for insertion into the conduit (36) of the seat (37) and for closing the inlet orifice (30).

9. The discharge rate and pressure control solenoid valve (1) according to any of claims 4 to 9, characterized in that said sleeve (27) has at least one channel (34, 34') for letting the fluid pass through towards the spool (18).

10. The discharge rate and pressure control solenoid valve (1) according

to any of the preceding claims, characterized in that the inlet orifice (30) is provided in a part (29) closing the liner (22), and the position of which is adjustable relatively to it.

11. The discharge rate and pressure control solenoid valve (1) according to any of the preceding claims, characterized in that the recoil means (26) exert on the flap, for an electromagnet control current equal to zero, such a force that it is required that the fluid have a pressure of the order of 30 bars for opening it.

12. A gasoline injection system for a heat engine with a common rail (4), said rail (4) being fed with gasoline at high pressure by a pump (3) itself supplied with low pressure gasoline from the tank (2) via a solenoid valve (1) according to claims 1 to 11, characterized in that the inlet orifice (30) of the solenoid valve (1) is connected to the high pressure fluid circuit downstream from the pump (3).

13. The gasoline injection system for a heat engine according to the preceding claims, characterized in that the common rail (4) includes a pressure sensor (6) connected to an electronic central unit (7) providing the set current value to the electromagnet of the solenoid valve (1).

14. The gasoline injection system for a heat engine according to the preceding claims, characterized in that the electronic central unit (7), when the sensor (6) detects overpressure relatively to the rated operating pressure of the rail (4), sends a signal for setting zero current to the electromagnet, with which the flap may be opened and the fluid may flow from the outlet of the pump (3) towards the tank (2).